

67,097-024; EH-11034  
Serial No. 10/769,169, filed 1/30/04

IN THE CLAIMS

1. (Original) A fuel system comprising:
  - a fuel storage tank;
  - a downstream use for fuel;
  - a fluid connection for communicating fuel from said fuel storage tank to said downstream use; and
  - a fuel deoxygenator mounted in said fluid connection, said fuel deoxygenator having a microporous polymer membrane disposed therein that defines a fuel passage within said fuel deoxygenator device for flow of fuel therethrough, wherein said microporous polymer membrane is comprised of micropores that have been reduced in size from a first size to a second size by a heat treatment, said second size being large enough to generally allow migration of a gas through said microporous polymer membrane and small enough to generally prevent migration of fuel into said microporous polymer membrane.
2. (Original) The fuel system as recited in claim 1, wherein said microporous polymer membrane is supported by a substrate.
3. (Original) The fuel system as recited in claim 1, wherein said heat treatment comprises heating the microporous polymer membrane at a temperature above 100°C.
4. (Original) The fuel system as recited in claim 3, wherein said heat treatment comprises heating the microporous polymer membrane at a temperature between about 130°C and about 150°C for about two hours.

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5. (Original) The fuel system as recited in claim 4, wherein said microporous polymer membrane is an amorphous fluoropolymer.

6. (Original) A method of preventing a liquid from migrating into a microporous polymer membrane comprising the steps of:

heating a microporous polymer membrane to a predetermined temperature for a predetermined time to reduce the size of micropores in the microporous polymer membrane from a first size to a second size, the second size being large enough to allow migration of a gas through the membrane and small enough to prevent migration of a liquid into the membrane; and disposing said microporous polymer membrane in a fluid separating device.

7. (Original) The method as recited in claim 6, wherein the predetermined temperature is above 100°C.

8. (Original) The method as recited in claim 7, wherein the polymer of the microporous polymer membrane has a glass transition temperature and the predetermined temperature is greater than the glass transition temperature.

9. (Original) The method as recited in claim 7, wherein the polymer of the microporous polymer membrane has a glass transition temperature and the predetermined temperature is about equal to the glass transition temperature.

10. (Original) The method as recited in claim 7, wherein the predetermined temperature is between about 130°C and about 150°C.

11. (Original) The method as recited in claim 7, wherein the predetermined time is about two hours.

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12. (Original) The method as recited in claim 7, wherein the microporous polymer membrane is an amorphous fluoropolymer.
13. (Original) The method as recited in claim 7, wherein the fluid separating device is a fuel deoxygenator in a fuel system.
14. (Original) The method as recited in claim 7, wherein the fluid separating device is in an aircraft.

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15. (Original) A microporous polymer membrane comprising micropores that have been reduced in size from a first size to a second size by a heat treatment, said second size being large enough to generally allow migration of a gas through said microporous polymer membrane and small enough to generally prevent migration of a liquid into said microporous polymer membrane.
16. (Original) The microporous polymer membrane as recited in claim 15, wherein said heat treatment comprises heating said microporous polymer membrane above 100°C.
17. (Original) The microporous polymer membrane as recited in claim 16, wherein the polymer of the microporous polymer membrane has a glass transition temperature and said heat treatment comprises heating said microporous polymer membrane to a temperature greater than said glass transition temperature.
18. (Original) The microporous polymer membrane as recited in claim 16, wherein the polymer of the microporous polymer membrane has a glass transition temperature and said heat treatment comprises heating said microporous polymer membrane to a temperature that is about equal to said glass transition temperature.
19. (Original) The microporous polymer membrane as recited in claim 16, wherein said heat treatment comprises heating the microporous polymer membrane to between about 130°C and about 150°C.
20. (Original) The microporous polymer membrane as recited in claim 16, wherein said heat treatment comprises heating the microporous polymer membrane for about two hours.
21. (Original) The microporous polymer membrane as recited in claim 16, wherein the microporous polymer membrane is an amorphous fluoropolymer.

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22. (Original) A fuel deoxygenator device comprising:

a fuel side and a non-fuel side separated by a microporous polymer membrane for removing gas from fuel flowing in contact with said microporous polymer membrane on said fuel side, and said microporous polymer membrane comprising micropores that have been reduced in size from a first size to a second size by a heat treatment, said second size being large enough to generally allow migration of said gas through said microporous polymer membrane and small enough to generally prevent migration of said fuel into said microporous polymer membrane.

23. (Original) The fuel deoxygenator device as recited in claim 22, wherein said non-fuel side comprises a lower gas partial pressure than said fuel side.

24. (Original) The fuel deoxygenator device as recited in claim 23, wherein said gas partial pressure comprises oxygen partial pressure.

25. (New) The method as recited in claim 6, further comprising forming the microporous polymer membrane in a step that is separate and distinct from heating the microporous polymer membrane to reduce the size of the micropores.

26. (New) The microporous polymer membrane as recited in claim 15, wherein the first size corresponds to the microporous polymer membrane after membrane formation and the second size corresponds to the microporous polymer membrane after the heat treatment.

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Additionally, there is no motivation to make the proposed combination. The fuel deoxygenator system (10) of *Spadaccini* includes an oxygen permeable composite membrane (42) that is resistant to penetration by liquid and allows oxygen from passing fuel to migrate through. Therefore, since *Spadaccini* already includes a membrane, there is no need or motivation to provide *Spadaccini* with the membrane of *Kidd*. For this additional reason, claim 1 and its dependents are properly allowable.

Regarding claims 3 and 4, claim 3 recites heating the membrane at a temperature above 100°C, and claim 4 recites heating the membrane at a temperature between about 130°C and about 150°C for about two hours. The Examiner contends that it would have been obvious to change the temperature of the pre-membrane at a temperature range recited in Applicant's claims 3 and 4 in order to obtain a membrane having an average pore size of about 0.1 micron to 10 micron. The rejection fails to state a motivation for making the proposed modification. The rejection merely states a desired result of obtaining an average pore size of about 0.1 micron to 10 micron. The desired result is not motivation to choose the particular solution of heat treating with a particular temperature and time. Therefore, the Applicant respectfully requests that the Examiner provide a motivation or withdraw the rejection.

Additionally, there is no motivation to make the proposed modification. For one thing, the heating process of *Kidd* is for forming the membrane, not reducing the micropore size. Furthermore, *Kidd* does not disclose any specific temperatures or times for the heating process. Therefore, there is no teaching or suggestion to adjust temperature/time to control the micropore size. Accordingly, claims 3 and 4 are properly allowable.

The Examiner rejected claims 7-14 and 16-21 under 35 U.S.C. §103(a) as being unpatentable over *Kidd*. The Examiner argues that it would have been obvious to change the temperature of the pre-membrane of *Kidd* at a temperature range cited in Applicant's claims to obtain a membrane having an average pore size of about 0.1 microns to 10 micron. As explained above, the rejection fails to state a motivation because the rejection merely states a desired result, which is not motivation to choose the particular solution. Also as explained above, there is no motivation to make the proposed combination because the heating process of *Kidd* is used to

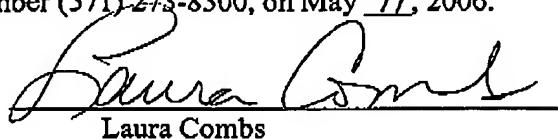
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